

# **BUSINESS PLAN**

## **CEN/TC 213**

### **Cartridge operated hand held tools - Safety**

#### **EXECUTIVE SUMMARY**

##### **Scope**

Standardisation in the field of safety of machines using propulsive charges (portable cartridge-operated tools). The standard EN 15895 "Cartridge operated hand-held tools - Safety requirements - Fixing and hard marking tools" is harmonized with the DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, Annex IV and was published in May 2011. The standard is successfully in use and the secretariat of CEN/TC 213 has received no requests for revisions or amendments.

After publication of the EN 16264 "Pyrotechnic articles - Other pyrotechnic articles - Cartridges for powder actuated tools", the safety of the entire PAT system is now ensured. Especially the suitability of the cartridges for the PAT system by the device specific rating of the CE conformity by using this standard.

##### **Use and significance of portable cartridge-operated fastening tools**

Portable cartridge-operated fastening tools are widely employed in the construction industry for fastening purposes. With a hand-held, cartridge-powered tool, nails are driven into concrete and steel without pre-drilling in order to attach loose objects to substrates ("direct" fastening). Studs are similarly used to produce fastening points unto which objects can later be attached by means of a thread.

Cartridge-operated fastening is the fastest and most productive solution for many fastening tasks in construction and compares favourably with screw fastening or use of anchors. The method is well established in several construction trades, i.e. interior finishing companies, electric installers, steel decking companies, and general building contractors. Typical applications include fastening of corrugated steel sheeting on steel beams or girders for decking or siding operations, fastening of steel grating on steel substructures, non-permanent fixing of wooden boards and formwork props on concrete, sill plate installation, and fastening of drywall track on floor, walls, and ceilings.

Portable cartridge-operated fastening tools were included in the EC Machinery Directive in Annex IV. To bring them to market by self-declaration, a valid European standard is required for reference.

Portable cartridge-operated fastening tools were introduced in the construction industry in the 1940ies. At this time, the tools worked with fasteners (nails) being driven into the base material by the energy of a propulsive charge. Propelled directly by the combustion gases, the fasteners reached dangerously high speeds. Increasing work safety was paramount for the successful spread of powder-actuated fastening. It was therefore desirable to achieve high fastening power combined with low fastener velocity.

This target was successfully reached with the inherently safe design principle of the piston-type tool. The combustion energy is transferred not directly to the fastener but to an intermediate piston of comparatively high mass. The piston moves at much slower speed than the fastener in old-fashioned gun-type tools driving the fastener into the base material by its inertia. Should the fastener penetrate

a thin base material altogether, consequentially, its low speed creates much less of a risk for persons behind the respective wall. By choosing the mass of the piston sufficiently large, the speed of the piston and nail can be greatly reduced without affecting the fastening energy itself. Typically, just a few percent of the total kinetic energy are thus contained in the moving fastener with the large majority in the piston mass. The piston in turn is enclosed inside the tool by an appropriate design such that the energy contained in its movement can only be transferred to the fastener by deceleration while entering a substrate.

From the early 1960ies, these tools rapidly established themselves in the construction industry and rapidly drove high velocity gun-type tools out of the market in many European countries.

Today, powder-actuated fastening tools of piston type are used extensively in construction for a host of fastening tasks on both steel and on concrete. Apart from the piston, user safety is ensured by a number of additional safety features designed into the tools preventing accidental triggering of the tools from a drop or from triggering without contact to the base material. Particular design features may be used to prevent the piston from pushing the fastener through thin base material.

Apart from the hazards as described above, safety issues can be created by badly controlled combustion inside the tool and from unsuitably designed tools: In the worst case, disintegration of the tool can result from the breach or barrel yielding to the pressure of the hot combustion gases.

To prevent accidents from either flaws in tool design, from unsuitable combinations of tools and cartridges, or from excessive pressure build-up due to irregular combustion conditions, all tool designs require approvals for commercial use in the construction site.

## **1 BUSINESS ENVIRONMENT OF THE CEN/TC**

### **1.1 Description of the Business Environment**

The following political, economic, technical, regulatory, legal and social dynamics describe the business environment of the industry sector, products, materials, disciplines or practices related to the scope of this CEN/TC, and they may significantly influence how the relevant standards development processes are conducted and the content of the resulting standard.

### **1.2 Quantitative Indicators of the Business Environment**

The following list of quantitative indicators describes the business environment in order to provide adequate information to support actions of the CEN /TC:

Figures concerning portable cartridge-operated fastening tools and accessories:

- Approximately 4.000 to 4.500 employees for manufacturing, selling and service in the European Union (Hilti, ITW, Würth, Berner, Bossong, Bierbach, Savania, Ejot, Powers, Fischer and smaller companies)
- Approx 15 companies produce and/or sell portable cartridge-operated fastening tools in the European Union. Counting all the independent dealers as well it might be approximately 400
- Portable cartridge-operated fastening tools are used by approx 200'000 companies in construction
- It is assumed that about 1.000 million fixings are executed every year in the European Union

### **1.3 Major factors that may have an impact on the development of the market**

In recent years, fasteners and cartridges for portable cartridge-operated fastening tools of Far East origin have begun to make their entry into the European market. At an increasing rate, manufacturers of fasteners and cartridges are offering their products through dealers. Many providers of cartridges are suppliers of military ammunition without any experience in fastening technology and the relevant tools. More recently, the first tools have also begun to emerge from Far East sources.

Tools, fasteners and cartridges must be considered as system components the quality of which determines user safety.

The quality of fasteners needs to be assured for consistently reliable fastenings. However, this concern is of less significance to tool users and is governed separately by relevant approvals by bodies such as EOTA (European Association for Technical Approvals).

The quality of tools and cartridges as well as their smooth interaction are of paramount importance for operator safety.

Some products have already been found with less than acceptable quality. In some cases, combustion of propellant charges produces residues at a level unacceptable for reliable tool operation. Operators who are used to safely functioning tools may not recognise the need to clean and maintain

their tools far more frequently than until now. This greatly increases the hazard of injury as tools jam or malfunction in various ways depending on their design.

Poor quality cartridges, in particular, producing the build-up of unburnt powder residues can lead to deflagration or even explosion of tools. This constitutes one of the most serious risks in this context.

## **2 BENEFITS EXPECTED FROM THE WORK OF THE CEN/TC**

- Operator safety and reliability

Experts from countries interested in the work of CEN/TC 213 will deliver the best knowledge and capability to assemble the best technical information and requirements in every aspect such as design, performance, installation, definition, test method etc. in order to assure reliability and safety of the complex tools for their customers. The cartridges being system components crucial for the safety of a portable cartridge-operated tool, the new standard will also provide regulations for these to ensure safe systems.

- Efficient trade

Development of a European standard on portable cartridge-operated fastening tools permits the continuation of efficient trade.

## **3 PARTICIPATION IN THE CEN/TC**

All the CEN national members are entitled to nominate delegates to CEN Technical Committees and experts to Working Groups, ensuring a balance of all interested parties. Participation as observers of recognized European or international organizations is also possible under certain conditions. To participate in the activities of this CEN/TC, please contact the national standards organization in your country.

Parties interested in CEN/TC 213 are

- European manufacturers of portable cartridge-operated fastening tools and/or cartridges;
- Corresponding trade unions or other bodies representing operator interests (in particular for safety standards);
- Testing and certification bodies involved in the current approval procedures of portable cartridge-operated fastening tools (e.g. C.I.P.).

## **4 OBJECTIVES OF THE CEN/TC AND STRATEGIES FOR THEIR ACHIEVEMENT**

### **4.1 Defined objectives of the CEN/TC**

#### **Elaboration and development of a safety standard for portable cartridge-operated fastening tools**

CEN/TC 213 is developing standards in support of *DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006*. Those standards are harmonized with the Essential Safety Requirements (ESRs) listed in the Machinery Directive by specifying requirements and/or measures for reducing or eliminating the risks associated with the hazards relevant to the product(s). The harmonized standards can be used by manufacturers/suppliers as

an alternative to the Machinery Directive for claiming “presumption of conformity” with the relevant ESRs of the directive.

The standards can be used outside of Europe for countries with no comprehensive regulations. Due to a C.I.P Decision the EN Standard may also be used in none-European C.I.P states e.g. Russia, Chile and UAE.

#### **4.2 Identified strategies to achieve the CEN/TC's defined objectives.**

The work programme of CEN/TC 213 produces the standard, as defined in objectives of the CEN/TC 213.

Specific strategies and initiatives within CEN/TC 213 are:

- Permanent supervision of the progress of work through the TC secretariat;
- To maintain a close contact and relationship with regard to safety standards CEN/CCMC; CEN/TC 213 and the CEN Consultants involved;
- To accept the defined work load of the key persons, as stipulated in this Business plan, coordination of the secretaries under the leadership of the Chairman where such an action appears appropriate;
- To actively contribute in solving of political or technical issues between CEN/TC 212 (PAT cartridges) and to continuously ensure the compatibility between EN 15895 (PAT tools) and EN 16264 (PAT cartridges) by review and possibly rework in case of requirements for changes to these standards caused by any new versions of either of the respective governing Directives, namely 2006/42/EC and 2013/29/EC.
- To cancel work items when it is clear that the industry expresses no need for it or is not prepared to provide sufficient experts to work on it;
- To hold plenary meetings as often as there is a justified need.

#### **4.3 Environmental aspects**

Environmental commitment:

- Environmental aspects in specifications and test standards of CEN/TC 213 will be identified and addressed in the drafting or revision of the standards.
- CEN/TC 213 promotes environmentally conscious thinking and behavior at all levels by sustainable and focused work on standards; ecological megatrends, e.g. renewable energies, are of the same importance as economic aspects. It encourages producers to comply with international rules (specifically concerning human rights, fair labour conditions and child labour) as well as business ethics.
- CEN/TC 213 will follow the recommendations in the adoption of a New Work Item, clause 6 and carefully check the environmental aspects which could be relevant on new project and will bring in environmental expertise from the experts in the working group combined with the environmental checklist. In case of uncertainty we will contact the CEN Environmental Helpdesk (CEN/EHD)

## **5 FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE CEN/TC WORK PROGRAMME**

- Contribution of experts

Since the experts work in standardization on a voluntary level the contribution from experts (e.g. from industry) is not always made available as expected.

- Balance of the working groups

It is recognised that not all the working groups have a perfect balance, e.g. manufacturers, users, and national safety bodies. New participants are welcomed.

- Lateness of comments from the CEN Consultant for Machinery

The Consultant is required to assess the draft and make comments/proposals during the Enquiry period and prior to Formal Vote. Due to pressure of work, he sometimes misses the deadline and submits his report after the end-of-Enquiry and the Comments Resolution Meeting (CRM). In these cases, the CRM is not alert of his comments and cannot deal with them in a timely manner.